

Editorial

The Journal of Nanotheranostics: A New Open-Access Journal at the Interface of Nanotechnology, Materials Science, and Medicine for Precision Medicine

S. Moein Moghimi ^{1,2} 

¹ School of Pharmacy, and Translational and Clinical Research Institute, Newcastle University, Newcastle upon Tyne NE1 7RU, UK; seyed.moghimi@ncl.ac.uk

² Colorado Center for Nanomedicine and Nanosafety, University of Colorado Anschutz Medical Campus, Aurora, CO 80045, USA

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Healthcare is changing. Today, we are harnessing the power of genomics, gene editing, and nanotechnology to build a solid foundation for a more patient-centric and individualized approach to healthcare and improving clinical outcomes. The emergence of the “precision medicine” paradigm is helping with the discovery of novel drug targets; drug repurposing; drug repositioning; and development of injectable, ingestible, and wearable nanotechnology-based composite therapeutic–diagnostic (theranostics) devices. Indeed, it is theranostics, which, together with breakthroughs in biomarker discovery, is becoming the driving force of precision medicine. An effective treatment planning must not only consider disease heterogeneity but also the broader aspects of disease microenvironment as therapy progresses. These include the dynamics of immune system microenvironment, rate-limiting biological barriers, and transport processes. For instance, our better understanding of complexity and diversity of tumor immune microenvironment has led to the development of immune-checkpoint inhibitors, which are showing significant clinical benefit in some patients. We need to expand on these advancements and further improve our ability to predict and guide immunotherapeutic responses. Theranostics offers the promise of improving disease detection and treatment planning through combined, controlled, and targeted therapeutic interventions and on-demand sensing and monitoring of spatiotemporal molecular, cellular, and anatomical changes. Theranostics could also work for patients *in vitro*, for instance through simultaneous determination of biomarker variability and its affinity for different ligands (e.g., a nanobody library) in cancer tissue biopsies with reporter nanoparticles and translation of these findings to improve chimeric antigen-receptor T-cell engineering for more effective immunotherapy outcomes. Furthermore, nanotheranostics is an indispensable tool in fundamental research, where nanotheranostic-mediated precision modulation and real-time monitoring of cellular processes will advance our understanding of complex and interrelated molecular events that regulate homeostasis and contribute to pathogenesis of different diseases. While the broad spectrum of exciting and emerging nanotheranostic technologies is beginning to offer unprecedented opportunities for precision medicine, many challenges still remain. These not only include aspects of device engineering and fine tuning but also biocompatibility, safety, and attributes for reproducible pharmaceutical development.

Notwithstanding, these exciting developments have set the agenda for inception of the *Journal of Nanotheranostics (JNT)*, an open-access international journal by MDPI (Basel, Switzerland), as a critical forum for dissemination of important fundamental, translational, and clinical developments in nanotheranostics. The journal will publish outstanding rigorously peer-reviewed original research papers, critical reviews, technical notes, brief communications, and opinion pieces on all aspects of nanotheranostics including device engineering, computational simulations, site-specific targeting,

molecular imaging, personalized nanomedicine, disease management, translational and clinical research, case reports, pharmaceutical process manufacturing, and ethical and regulatory issues. We also welcome research papers with negative results to move the field forward. The journal also runs Special Issues to create collections of papers on specific hot topics that will develop new ideas and research directions. The journal's Editorial Board and staff are committed to building *JNT* into the leading scientific journal in its field by publishing articles of the highest scientific quality and interesting to a broad readership. Articles published in *JNT* will be open-access articles distributed under the terms and conditions of the Creative Commons Attribution License. *JNT* is available free to readers around the world, and the copyright is retained by the author(s).

On behalf of the Editorial Board, I invite you to submit your exciting work and suggestions for Special Issues to *JNT*, and I am looking forward to receiving your contributions. Together we will build an outstanding journal.

Conflicts of Interest: The author declares no conflict of interest.

Short Biography of Author



Moein Moghimi is a Professor of Pharmaceutics and Nanomedicine (School of Pharmacy) and Research Professor (Translational and Clinical Research Institute) at Newcastle University (UK); Adjoint Professor at the Department of Pharmaceutical Sciences, Skaggs School of Pharmacy and Pharmaceutical Sciences, University of Colorado-Denver Medical Center (USA); and Associate Editor of *Molecular Therapy* (Cell Press). His earlier appointments have included Professor and Chair in Pharmaceutics at the School of Medicine, Pharmacy and Health, Durham University, UK (2016–2017); Full Affiliate Member/Professor at the Methodist Research Institute, Houston Methodist Hospital Systems, Houston, Texas, USA (2013–2017); Visiting Professor at Università Degli Studi Di Padova, Padova, Italy (2015); Professor of Nanomedicine (at the Department of Pharmacy), Professor of Pharmaceutical Nanotechnology (at the NanoScience Center); and Founder/Director of the Center for Pharmaceutical Nanotechnology and Nanotoxicology, University of Copenhagen, Denmark (2008–2016); and Honorary Professor of Nanomedicine at the Multidisciplinary Research Center, Shantou University, China (2008–2010).

Prof. Moghimi's research is centered on fundamental and translational aspects of nanomedicine engineering and performance, with the overall goal of advancing fundamental understanding of biological barriers in relation to nanoparticle performance and safety, and within the context of precision medicine applicable to cancer, cardiovascular diseases, immune disorders, and disease of the central nervous system. To date, Prof. Moghimi has published >300 research papers, reviews, book chapters, proceedings, and patents/patent applications, and his work is highly cited in scientific literature. He is widely reported in general, local, and professional press and serves on the editorial boards of >10 international journals including *Advanced Drug Delivery Reviews*, *Journal of Controlled Release*, and *Nanomedicine (UK)*.

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